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Sensing Disks for Slug-Type Calorimeters Have Higher Temperature Stability

The problem:

To provide a sensing disk for slug-type radiation calorimeters that will exhibit better performance at high temperatures (up to 2500°F) compared to copper and nickel disks that are presently used in commercial calorimeters.

The solution:

Fabricate the sensing disk from graphite, which has been heat-soaked at 1500°F to stabilize its emittance.

The thermocouple must be protected from the graphite in such a way that repeated temperature cycling does not change the thermocouple sensitivity. Most thermocouple materials, especially platinum/platinum-10 rhodium, are readily carburized when in contact with graphite. This protection is afforded by a tungsten coating which is applied to the back face of the graphite disk by vapor deposition. The thermocouple is then flash-welded to the tungsten.

Note:

Inquiries concerning this invention may be directed to:

Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama 35812
Reference: B67-10161

Patent status:

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